REMARKS

Applicant appreciates the time taken by the Examiner to review Applicant's present application. Applicant has amended Claims 13, 24, 65-70, 72, 74-80, 82-91 and 93-99. Applicant respectfully submits that no new matter has been added. Thus, Claims 1-6, 8, 10-18, 20-32, 34-44, 46-56, 58-70, 72, 74-91, 93-108 and 110-113 remain pending. This application has been carefully reviewed in light of the Official Action mailed February 4, 2008. Applicant respectfully requests reconsideration and favorable action in this case.

Rejections under 35 U.S.C. § 101

Claims 13-23, 24-28, 65-98 and 99-103 stand rejected under 35 U.S.C. § 101. Applicant respectfully submits that the amendments to the claims render the rejection of these claims moot and respectfully requests that it be withdrawn.

Rejections under 35 U.S.C. § 103

Claims 1-8, 10-13, 20-23, 65, 71, 72, 74, 75 and 76 were rejected as obvious over U.S. Patent No. 6,920,171 ("Souissi") in view of EP 1119112 ("Panaski") and U.S. Patent No. 6,549,784 ("Kostic"). Claims 2-6, 14-18 and 66-70 were rejected as obvious over Souissi and Panaski in view of U.S. Patent No. 6,553,019 ("Laroia"). Claims 99-107 and 110-113 were rejected as obvious over Souissi in view of U.S. Patent No. 6,246,713 ("Mattisson"). Claim 108 was rejected as obvious over Souissi and Mattisson in view of Kostic and U.S. Patent No. 6,731,939 ("Watanabe").

In order to establish a prima facie case of obviousness, the Examiner must show: that the prior art references teach or suggest all of the claim limitations. Applicant respectfully submits that the Examiner's prima facie case of obviousness fails at least because Souissi, Watanabe, Panaski, Kostic, Laroia, Zyren, Larsson, and Mattisson (either alone or in combination) fail to disclose all the limitations of the rejected claims.

Claim 1 recites a method of establishing a set of piconets comprising: generating a set of codes, wherein each code corresponds to a sequence of dwell times and bands, wherein the sequence includes at least one group of dwell times; assigning codes to the piconets in the set of piconets, wherein: each piconet in the set of piconets has a unique code compared to the other piconets in the set of piconets, wherein the unique code is a member of the set of codes; and during a time span, any two different piconets in the set of piconets are capable of using one or more same bands for a collective time for each group of dwell times, no longer than the longest

dwell time within such group of dwell times; and substituting an extra band for an existing band, wherein before substituting, the unique codes do not correspond to the extra band. Claims 13 and 65 recite similar limitations.

Therefore, in one embodiment, a set of piconets may each utilize a set of bands to communicate. To help avoid interference between the piconets caused by piconets using the same band at the same time, a set of codes may be utilized. By having the piconets transmit on a set of bands according to the set of codes interference between the piconets may be reduced. More specifically, in one embodiment, a code may designate a sequence of bands for a number of dwell times. A set of codes may therefore comprise one or more codes where each of the codes in the set differs from every other code in the set. Furthermore, each code may designate a different sequence of the same set of bands. When each piconet transmits on the set of bands according to a unique one of these codes (e.g. each piconet may transmit on the set of bands according to the sequence of a different code) interference may be reduced by reducing contention time between piconets.

Notice then that these codes designate a sequence of bands. Thus, as the piconets transmit on bands according to a particular code, the bands on which a piconet transmits may be predetermined not random. In fact, in one embodiment, the set of codes may be designed or configured based on the number bands being utilized, etc. such that if each of a set of piconets transmits on a unique code the contention time may not exceed a ratio of the length of the code.

Souissi, in contrast, teaches a method for avoiding interference by allowing devices to anticipate collisions during certain slots (*See* Souissi, Abstract) and assigning priorities to the piconets, such that transmissions from a high priority piconet may prevail in case of an anticipated collision or other corrective action may be taken. (*See* Souissi, Abstract). While Souissi is designed to be utilized with piconets which operate according to frequency hopping sequences, Souissi only discusses one particular type of frequency hopping sequence, namely the frequency hopping sequence associated with the Bluetooth protocol.

In particular at Column 5, Line 20 of Souissi it is disclosed that:

> In situations where it is appropriate to provide active communications for many user devices at the same time (e.g., more than seven in Bluetooth), it is possible to provide a plurality of piconets that at least partly encompass the same physical

> area and have independent frequency hopping sequences controlled by different masters. The 79 channels and 1,600 time slots per second provide many combinations of time slots and frequencies, but any two independently operating piconets that affect one another (for example because they are adjacent in space), will occasionally experience a message collision because the two independent piconets will sometimes choose the same frequency channel during at least part of the same time slot.
>
> The sending and receiving devices step through the same identical sequence of frequency hops in order to remain in communication. According to the Bluetooth protocol, the specific frequency hopping sequence of any of the communicating devices can be derived by an algorithm from a 48 bit identity code that is unique to each device, the sequence being randomized by the time of day.

Notice here two main things. First, the frequency hopping sequences disclosed in Souissi with respect to the Bluetooth protocol are pseudo-random sequences, meaning that even though there may be 79 channels and 1600 frequency jumps per second, the frequency hopping sequence used by any piconet is determined pseudo-randomly. Meaning that it is, in theory, possible for any two piconets to be transmitting according to the exact same frequency hopping sequence. In other words it is not guaranteed or suggested that each piconet of any set of piconets is utilizing a unique frequency hopping code. This means that Souissi discloses that piconets transmit on an essentially random sequence of bands and thus the bands on which devices on a piconet of Souissi transmit is for all intents and purposes not predetermined.

Second, even if the piconets disclosed in Souissi happen, by substantially random chance, to be transmitting according to different frequency hopping sequence, note again that these frequency hopping sequences are determined pseudo-randomly. Thus, utilizing these randomly determined frequency hopping sequences it can also not be assured by Souissi that during a time span, any two different piconets in the set of piconets are capable of using one or more of the same bands for a collective time for no longer than the longest dwell time within such group of dwell times. This may be illustrated more clearly with respect to the first point above, if it cannot be guaranteed by Souissi that each piconet will be utilizing a unique frequency hopping sequence it certainly cannot be guaranteed that during a time span that any two different piconets can utilize two bands together for a collective time no longer than the longest dwell time within such group of dwell times. After all, if each piconet of Souissi is transmitting according to the same frequency hopping sequence the piconets will all be utilizing the same bands during substantially all dwell times.

Accordingly, Applicant respectfully submits that Souissi does not disclose at least the limitations of Claim 1 which recites each code corresponds to a sequence of dwell times and bands, wherein the sequence includes at least one group of dwell times; assigning codes to the piconets in the set of piconets, wherein: each piconet in the set of piconets has a unique code compared to the other piconets in the set of piconets, wherein the unique code is a member of the set of codes; and during a time span, any two different piconets in the set of piconets are capable of using one or more same bands for a collective time for each group of dwell times, no longer than the longest dwell time within such group of dwell times; and substituting an extra band for an existing band, wherein before substituting, the unique codes do not correspond to the extra band.

As neither the Panaski, Kostic, Laroia nor Mattisson references remedy this deficiency Applicant respectfully requests the withdrawal of the rejection of Claim 1, similar Claims 13 and 65 and their respective rejected dependent Claims 2-8, 10-12, 20-23, 71, 72, 74, 75 and 76.

Claims 24-28 were rejected as obvious over U.S. Patent No. 6,731,939 ("Watanabe") in view of *Time-Frequency-Code Slicing: Efficiently Allocating the Communications Spectrum to Multirate Users* ("Karol"). Claim 24, as amended, recites a set of piconets comprising a first piconet and a second piconet, wherein within the set of piconets: each piconet comprises at least one device; the first piconet has a first code corresponding to a first sequence of designated bands; and the second piconet has a second code that corresponds to a second sequence of designated bands, wherein the second code is unique from the first code; and at least one band is present in the first sequence that is not present in the second sequence, wherein in response to interference, an extra band is substituted for an existing band of the first sequence of designated bands or the second sequence of designated bands, wherein before substituting, the code does not correspond to the extra band.

Watanabe discloses an apparatus and an associated method for utilizing a Bluetooth-compatible access point and mobile stations of a WLAN. (*See*, Watanabe Abstract). Thus, as in Souissi (discussed above) the frequency hopping sequences disclosed in Watanabe pertain to the Bluetooth protocol. As noted in the above discussion with respect to the Bluetooth protocol the use of pseudo-random sequences means that the frequency hopping sequence used by any piconet is determined pseudo-randomly. Meaning that it is, in theory, possible for any two piconets to be transmitting according to the exact same frequency hopping sequence.

Additionally, as the frequency hopping sequences Watanabe are pseudo-random they may all utilize all the bands at any given time.

As such then, Watanabe does not disclose the limitations of Claim 24 which recite that the second code is unique from the first code and at least one band is present in the first sequence that is not present in the second sequence, wherein in response to interference, an extra band is substituted for an existing band of the first sequence of designated bands or the second sequence of designated bands, wherein before substituting, the code does not correspond to the extra band. Furthermore, it is respectfully submitted that Karol does not remedy the deficiencies of Watanabe.

Accordingly, Applicant respectfully requests the withdrawal of the rejection of Claims 24-28.

Claims 29, 41, 53, 30, 42, 54, 31, 43, 55, 32, 44, 56, 37, 47 and 59 were rejected as obvious over U.S. Patent No. 7,039,358 ("Shellhammer") in view of U.S. Patent No. 6,377,608 ("Zyren"). Claim 36 was rejected as obvious over Shellhammer and Zyren and Kostic in view of U.S. Publication No. 2004/0196784 ("Larsson"). Claims 37, 49 and 61 were rejected as obvious over Shellhammer and Zyren and Kostic in view of U.S. Patent No. Laroia. Claims 38, 50, 62, 39, 51, 63 and 40 were rejected as obvious over Shellhammer, Zyren, Kostic and Laroia, in view of Mattisson. Claims 77, 78, 88, 89, 79, 90, 80, and 91 were rejected as obvious over Shellhammer, in view of Zyren and Kostic. Claims 83 and 94 were rejected as obvious over Shellhammer in view of Zyren and Kostic and further in view of Larsson. Claims 84 and 95 were rejected as obvious over Shellhammer and Zyren in view of Kostic and Laroia. Claims 85, 96, 86, 97, 87 and 98 were rejected as obvious over Shellhammer, Zyren, Kostic and Laroia in view of Mattisson.

Claim 41 recites a method of using a set of piconets comprising: changing a first band from a designated state to an undesignated state, wherein: the set of piconets comprises the first piconet; each piconet in the set of piconets has a unique code compared to the other piconets in the set of piconets, wherein the each unique code corresponds to a sequence of dwell times and bands including the first band, wherein the sequence includes at least one group of dwell times; and substituting an extra band for the first band, wherein before substituting, the unique codes do not correspond to the extra band. Claims 29, 53, 77, 88, 99 and 104 recite similar limitations.

Shellhammer discloses techniques for frequency coordination among two different wireless protocols. The protocols discussed in Shellhammer specifically are the 802.11 and Bluetooth protocols. As discussed above with respect to both the Souissi and Watanabe references the Bluetooth protocol utilizes pseudo-random frequency hopping sequences. The 802.11 protocol discussed in Shellhammer also uses pseudo-random sequences for transmission. (*See,* Shellhammer, Abstract, Col. 1, Lines 31-45).

Again then, as noted in the above discussion with respect to the Bluetooth protocol the use of pseudo-random sequences means that the frequency hopping sequence used by any piconet is determined pseudo-randomly. Meaning that it is, in theory, possible for any two piconets to be transmitting according to the exact same frequency hopping sequence. Additionally, as the frequency hopping sequences Shellhammer are pseudo-random they may all utilize all the bands at any given time.

As such then, Shellhammer does not disclose at least the limitations of Claim 41 which recite that the set of piconets comprises the first piconet; each piconet in the set of piconets has a unique code compared to the other piconets in the set of piconets, wherein the each unique code corresponds to a sequence of dwell times and bands including the first band, wherein the sequence includes at least one group of dwell times; and substituting an extra band for the first band, wherein before substituting, the unique codes do not correspond to the extra band. Furthermore, it is respectfully submitted that Zyren, Kostic, Larsson, Laroia and Mattisson do not remedy the deficiencies of Shellhammer. Accordingly, Applicant respectfully requests the withdrawal of the rejection of Claim 41, similar Claims 29, 53, 77, 88, 99 and 104 and their respective dependent Claims 30-32, 34-40, 42-44, 46-52, 54-56, 58-70, 72, 74-76, 78-91, 93-98, 100-103, 105-108 and 110-113

Conclusion

Applicant has now made an earnest attempt to place this case in condition for allowance and thanks the Examiner for the determination of allowable subject matter. Other than as explicitly set forth above, this reply does not include an acquiescence to statements, assertions, assumptions, conclusions, or any combination thereof in the Office Action. For the foregoing reasons and for other reasons clearly apparent, Applicant respectfully requests full allowance of claims 1-6, 8, 10-18, 20-32, 34-44, 46-56, 58-70, 72, 74-80, 82-91, 93-108 and 110-113. The

Examiner is invited to telephone the undersigned at the number listed below for prompt action in the event any issues remain.

The Director of the U.S. Patent and Trademark Office is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 50-3183 of Sprinkle IP Law Group.

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